

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Reserve

Ag 84AW

LIBRARY
CURRENT SERIAL RECORD
1943
U. S. DEPARTMENT OF AGRICULTURE

Equipment Needed

1. Tables, a sink, and running water.
2. A set of household scales.
3. Suitable containers for packaging and a wide-mouthed funnel for filling the packages.
4. Pans, stainless knives, a knife sharpener, cutting boards, measuring cups, and dippers.
5. Paraffin, cold-storage tape, or other material for sealing containers; a flatiron or curling iron for heat sealing; tags or crayons for labeling; and a notebook for records.
6. For fruit: Colander or wire-screen sieve or washing fruit with a water spray. Enamel, earthenware, or other noncorroding containers for washing and holding prepared fruit. Containers for mixing fruit with sugar or making syrup. Noncorroding screen sieve or special conical fruit sieve for pureeing fruit.
7. For vegetables: A good heating unit ready to give a quick, hot fire; enamel or aluminum kettles of several gallons' capacity, with lids, for blanching; similar large kettles or a handy sink for cooling blanched material; a fine-mesh wire rack, with handles, for lowering the food into the blanching kettle and the cooling water; a screen or cloth drain for the cooled vegetables. A timepiece is needed to time the blanching period.

Preparing Home-Grown

Vegetables and Fruits for FREEZING



Issued by
 BUREAU OF AGRICULTURAL
 AND INDUSTRIAL CHEMISTRY
 Agricultural Research Administration
 U. S. Department of Agriculture
 Washington, D. C.
 August 1943

Preparing for Freezing • • • DIREC

VEGETABLE OR FRUIT	PREPARATION	BLANCHING	PACKING	COOKING ¹ FROZEN FOOD	USES
Huckleberries (See blueberries)					
Mushrooms	Discard defective mushrooms. Sort into button-size and larger and carefully wash in cold water.	Blanch button-sized mushrooms or pieces 2 minutes; larger sizes and pieces, 3 to 4 minutes. Cool in cold water.	Pack in brine.	Fry 5 minutes.	Fried mushrooms; in casserole dishes.
Nectarines	Sort, wash, drain, halve, and pit. May be coarsely crushed or pureed. Use sulfur dip if desired or practicable.	Halves or slices may be blanched in steam 3 to 4 minutes, or in boiling 25-percent sirup (6½ cups sugar to 1 gallon of water) 4 to 5 minutes.	Pack promptly with 40-percent sirup, 35-percent for very sweet fruit. Chill sirup before adding. Mix crushed fruit or puree with sugar, 3 to 1.		Halves or slices for dessert. Coarsely crushed mixed with slices for sundae topping or cobbler. Puree for flavor base for ice cream, sherbet, or milk shakes.
Peaches, clingstone	Select peaches picked at full maturity. Sort, and peel by dipping in hot (180° F. to boiling) 2- to 5-percent lye solution for 45 seconds to 1½ minutes. Remove fruit to cold, clean water and rub off skin with hands. Rinse in cold water. Pit and slice.	Blanch slices in live steam 3 to 4 minutes, or in boiling sirup, 15 to 20 percent sugar, for 3 minutes. Cool in water or spread out in air. Dip in sodium sulfite solution if desired or practicable.	Pack and freeze without sugar or sirup.		Pie, sauce, or cobbler.
Peaches, freestone	Select firm-ripe, richly colored fruit. Sort and peel, loosening skin by 15 to 30 seconds in live steam or boiling water. Halve and pit. Dip in sodium sulfite solution.		Cover halves or slices promptly with chilled 40-percent or 50-percent sugar sirup. Mix coarsely crushed or pureed fruit with sugar in 3 to 1 proportion.		Halves and slices for pie, cobbler, fresh dessert; crushed and pureed for sundae topping and flavor base. Rapidly frozen puree for frozen dessert.
Peas	Shell ripe but not over-mature peas of green-skinned, wrinkle-seeded, not canning, varieties. ² Discard over-large, hard, or starchy peas. Wash.	Blanch in boiling water or steam 1 minute, cool rapidly, and drain.	Pack promptly with or without brine.	Boil or steam 5 to 7 minutes.	Hot vegetable; in vegetable salad.
Peppers, green and pimiento	Wash and cut into halves, quarters, or slices, removing the seeds.	Blanching not necessary, but makes packing easier. Use boiling water or steam, 2 minutes; cool promptly in water.	Cover with brine.		In slaw, or cooked in stew.
Persimmons	Sort soft-ripe, sweet fruit, wash, cut up, and pulp. Peel before pulping if desired.		Pack with sugar in ratio of 5 to 1 or 4 to 1, thoroughly mixed.		Flavor base for ice cream or sherbet; frozen rapidly for frozen dessert.

¹ Cooking time as given starts, in the boiling method, when the water boils after the vegetable is put in; in the steaming method, when a heavy cloud of steam rises to the top of the water.

ONS • • • Using Frozen Products

VEGETABLE OR FRUIT	PREPARATION	BLANCHING	PACKING	COOKING ¹ FROZEN FOOD	USES
Prunes and plums	Sort, wash, halve, and pit.		Pack prune halves with sugar sirup or coat with sugar; sirup pack is preferable. Puree plums with sugar in ratio of 4 or 3 to 1.		Halves for pie, cobbler, open-face cake, dessert; juice and puree for sherbet flavor base.
Pumpkin and squash	Winter varieties: Peel, discard seeds, cut into 1-inch cubes, cook until soft, mash, and cool. Summer varieties: Slice in ½-inch pieces.	Blanch in boiling water 3 to 4 minutes, cool in cold water, and drain.	Pack without brine.	Boil 10 to 15 minutes.	Hot vegetable.
Raspberries, black	Carefully sort and screen berries to retain large, full-ripe dark ones. Do not wash unless necessary. If washed, drain berries thoroughly.		Pack whole berries dry; seedless puree in a 3-to-1 fruit-sugar mix.	Boil 10 to 15 minutes.	Hot vegetable.
Raspberries, red, purple, or yellow	Select firm-ripe, brightly colored berries and handle with more care than other berries. Sort, but wash only if necessary and then drain thoroughly.		Pack whole berries with 40- to 50-percent sugar sirup; or with sugar in 5, 4, 3 or 1 proportions; or without sugar or sirup. Freeze dry berries loose before packaging. Mix puree with 1 part of sugar to 3 of fruit.		Whole berries for juice, jam, or jelly. Puree for flavor base.
Rhubarb	Wash, trim, and cut tender stalks into 1-inch pieces.	Blanch in boiling water 1½ minutes, cool in cold water, drain.	Pack without sugar or sirup.	Stew 10 to 12 minutes.	Pie and sauce.
Soybeans, green edible	Boil in water or steam for 5 minutes, cool, and squeeze out the beans. Wash and drain.	No additional blanching is required.	Pack with or without brine.	Boil or steam 10 to 15 minutes.	Hot vegetable; in vegetable salad.
Spinach and other greens	Thoroughly wash deep-green, tender greens. Remove imperfect leaves and larger, tough stems.	Blanch in boiling water or steam for 1½ minutes. Cool promptly in cold water and drain thoroughly.	Pack without brine.	Boil or steam 4 to 6 minutes. Boil kale 14 to 20 minutes. Partially thaw spinach before cooking.	Hot vegetables.
Strawberries	Sort and hull, if this was not done at picking. Wash and drain thoroughly. Leave berries whole, slice, or crush coarsely.		Cover whole berries with sugar sirup. Mix sliced or crushed berries with sugar in 3 to 1 proportion.		Dessert, pie, cobbler, preserves, jam. For short-cake, a mixture of coarse-crushed and whole berries is best. Puree for sundae topping, flavor base, and frozen dessert.
Turnips and rutabagas	Cut off tops, wash, and peel. Dice into ¼-inch cubes.	Blanch in boiling water or steam 2 to 3 minutes. Cool in cold water; drain.	Pack without brine.	Boil 12 to 15 minutes.	Hot vegetable.

Preparing for Freezing • DIRECTIONS • Using Frozen Products

VEGETABLE OR FRUIT	PREPARATION	BLANCHING	PACKING	COOKING ¹ FROZEN FOOD	USES
Huckleberries (See blueberries)					
Mushrooms	Discard defective mushrooms. Sort into button-size and larger and carefully wash in cold water.	Blanch button-sized mushrooms or pieces 2 minutes; larger sizes and pieces 3 to 4 minutes. Cool in cold water.	Pack in brine.	Fry 5 minutes.	Fried mushrooms; in casserole dishes.
Nectarines	Sort, wash, drain, halve, and pit. May be coarsely crushed or pureed. Use sulfur dip if desired or practicable.	Halves or slices may be blanched in steam 3 to 4 minutes, or in boiling 25-percent sugar (6½ cups sugar to 1 gallon of water) 4 to 5 minutes.	Pack promptly with 40-percent sirup, 15-percent for very sweet fruit. Chill syrup before adding. Mix crushed fruit or puree with sugar, 3 to 1.		Halves or slices for dessert. Coarsely crushed mixed with slices for sundae topping or cobbler. Puree for flavor base for ice cream, sherbet, or milk shakes.
Peaches, clingstone	Select peaches picked at full maturity. Sort, and peel by dipping in hot (180° F to boiling) 2- to 5-percent lye solution for 45 seconds to 1½ minutes. Remove fruit to cold, clean water and rub off skin with hands. Rise in cold water. Pit and slice.	Blanch slices in 1½-cup steam 3 to 4 minutes, or in boiling sirup, 15 to 20 percent sugar, for 3 minutes. Cool in water or spread out in air. Dip in sodium sulfite solution if desired or practicable.	Pack and freeze without sugar or sirup.		Pie, sauce, or cobbler.
Peaches, freestone	Select firm-ripe, richly colored fruit. Sort and peel, loosening skin by 15 to 30 seconds in live steam or boiling water. Halve and pit. Dip in sodium sulfite solution.	Cover halves or slices promptly with distilled 40-percent or 50-percent sugar sirup. Mix coarsely by crushed or pureed fruit with sugar in 3 to 1 proportion.			Halves and slices for pie, cobbler, fresh dessert; crushed and pureed for sundae topping and Bavaroise. Rapidly frozen puree or frozen dessert.
Peas	Shell ripe but not over-mature peas of green, skinned, wrinkle-seeded, not canning varieties. ² Discard over-large, hard, or starchy peas. Wash.	Blanch in boiling water or steam 1 minute, cool rapidly, and drain.	Pack promptly with or without brine.	Boil or steam 5 to 7 minutes.	Hot vegetable; in vegetable salad.
Peppers, green and pimiento	Wash and cut into halves, quarters, or slices, removing the seeds.	Blanching not necessary, but makes packing easier. Use boiling water or steam, 2 minutes; cool promptly in water.	Cover with brine.		In stew, or cooked in slow.
Persimmons	Sort soft-ripe, sweet fruit, wash, cut up, and pulp. Peel before pulping if desired.		Pack with sugar in ratio of 5 to 1 or 4 to 1, thoroughly.		Flavor base for ice cream or sherbet; frozen rapidly for frozen dessert.

VEGETABLE OR FRUIT	PREPARATION	BLANCHING	PACKING	COOKING ¹ FROZEN FOOD	USES
Prunes and plums	Sort, wash, halve, and pit.		Pack prune halves with sugar sirup or coat with sugar sirup pack is preferable. Puree elements with sugar in ratio of 4 or 3 to 1.		Halves for pie, cobbler, open-face cake, dessert, juice, and puree for sherbet-flavor base.
Pumpkin and squash	Winter varieties. Peel, sliced seeds, cut into 1-inch cubes, cook until soft, mash, and cool. Summer varieties, slice on ½-inch pieces.	Blanch in boiling water 3 to 4 minutes, cool in cold water, and drain.	Pack without brine.	Boil 10 to 15 minutes.	Hot vegetable.
Raspberries, black	Carefully sort and screen berries to retain large, full-ripe dark ones. Do not wash unless necessary. If washed, drain berries thoroughly.		Pack whole berries dry, seedless puree in a 3-to-1 fruit-sugar mix.		White berries for juice, jam, or jelly. Puree for flavor base.
Raspberries, red, purple, or yellow	Select firm-ripe, brightly colored berries and handle with more care than other berries. Sort, but wash only if necessary and then drain thoroughly.		Pack whole berries with 40 to 50 percent sugar sirup; or with sugar in 3, 3 or 4 proportions, or without sugar or sirup. Freeze dry berries loose before packaging. Mix puree with 1 part of sugar to 3 part fruit.		Pie, cobbler, dessert, preserves, jam. Seedless puree for flavor base or sundae topping. Rapidly frozen puree for frozen dessert.
Rhubarb	Wash, trim, and cut tender stalks into 1-inch pieces.	Blanch in boiling water 1½ minutes, cool in cold water, drain.	Pack without sugar or sirup.	Sew 10 to 12 minutes.	Pie and sauce.
Soybeans, green edible	Boil in water or steam for 5 minutes, cool, and squeeze out the beans. Wash and drain.	No additional blanching is required.	Pack wash or without brine.	Boil or steam 10 to 15 minutes.	Hot vegetable; in vegetable salad.
Spinach and other greens	Thoroughly wash deep-green, tender greens. Remove imperfect leaves and larger, tough stems.	Blanch in boiling water or steam for 1½ minutes. Cool promptly in cold water and drain thoroughly.	Pack without brine.	Boil or steam 4 to 6 minutes. Cool 20 minutes. Partly thaw spinach before cooking.	Hot vegetables.
Strawberries	Sort and hull, if this was not done at picking. Wash and drain thoroughly. Leave berries whole, slice, or crush coarsely.		Cover whole berries with sugar sirup. Mix 1 sliced or crushed berries with sugar in 3 to 1 proportion.		Dessert, pie, cobbler, preserves, jam. For short-cake, a mixture of coarse-crushed and whole berries for sundae topping. Flavor base for frozen dessert.
Turnips and rutabagas	Cut off tops, wash, and peel. Dice into ½-inch cubes.	Blanch in boiling water or steam 2 to 3 minutes. Cool in cold water; drain.	Pack without brine.	Boil 12 to 15 minutes.	Hot vegetable.

¹ Cooking time as given varies in the blanching method, when the water boils or the vegetable is put in, in the steaming method, when a heavy cloud of steam rises to the top of the vessel after the vegetable is added.

² Thomas Laxton type of peas may be either canned or frozen.

Equipment Needed

1. Tables, a sink, and running water.
2. A set of household scales.
3. Suitable containers for packing and a wide-mouthed funnel for filling the packages.
4. Pans, stainless knives, a knife sharpener, cutting boards, measuring cups, and dippers.
5. Paraffin, cold-storage tape, or other material for sealing containers; a flatiron or curling iron for heat sealing; tags or crayons for labeling; and a notebook for records.
6. For fruit: Colander or wire-screen sieve or washing fruit with a water spray. Enamel, earthenware, or other noncorroding containers or washing and holding prepared fruit. Containers for mixing fruit with sugar or making sirup. Noncorroding screen sieve or special noncorrosive fruit sieve for pureeing fruit.
7. For vegetables: A good heating unit easy to give a quick, hot fire; enamel or aluminum kettles of several gallons' capacity, with lids, for blanching; similar large kettles or a handy sink for cooling blanched material; a in-mesh wire rack, with handles, for lowering the food into the blanching kettle and the cooling water; a screen or cloth drain for the cooled vegetables. A timpiece is needed to time the blanching period.

Issued by
**BUREAU OF AGRICULTURAL
AND INDUSTRIAL CHEMISTRY**
Agricultural Research Administration
U. S. Department of Agriculture
Washington, D. C.
August 1943

Reserve

Ag 8444

LIBRARY
CURRENT SERIAL RECORD

Preparing 1943

U. S. DEPARTMENT OF AGRICULTURE

Home-Grown

Vegetables and Fruits
for FREEZING



PREPARING HOME-GROWN VEGETABLES AND FRUITS FOR FREEZING

VICTORY GARDENS that bear an abundance of food for winter eating will also produce a surplus that should not be wasted. Perishable fruits and vegetables can be preserved for winter use in a number of ways—canning, drying, salting, and freezing offer a choice of methods, each of which has its advantages. The method or methods to use will depend largely on the equipment available.

Fruits (except and here on) are freezer cabinets or community freezers lockers retain their natural color, flavor, and nutritive values to a high degree. It is important, however, that they be prepared and packaged carefully and stored under the right conditions. This folder gives specific directions for preparing home-grown vegetables and fruits for freezing and also for cooking the frozen products.

How Freezing Preserves Foods

All fresh foods contain bacteria, molds, and yeasts that multiply and cause spoilage if they are allowed to grow. Lower temperatures slow down their growth. Blanching (scalding) vegetables before freezing them destroys some bacteria, and many more are killed by subzero temperatures. A few always remain in the food, however, to start spoilage when it is thawed. Frozen foods, therefore, should be treated as fresh foods and used or cooked promptly.

Chemical agencies called enzymes are also present in all living matter. In plant products they first bring about ripening and then spoilage. Their action is slowed down at lower temperatures, much as is that of bacteria, but no economical freezing temperature will stop it completely. A temperature of 0° F is required to stop enzyme activity sufficiently for safe storage for any length of time.

By slowing down the action of all these spoilage agents, freezing keeps fresh food for 6 months to a year or more in approximately the same condition as when stored.

Handle and Prepare Foods Carefully

Clean foods prepared with clean equipment and pure water contain fewer spoilage organisms. Sort, wash, and pare fruits and vegetables for freezing in the same way as for the table. Avoid unnecessary handling, particularly of ripe fruit.

Do not waste locker space by filling it with produce that will not be suitable in every way for immediate use when removed from the locker. Freeze all fruits and vegetables the day they are picked—within a few hours if possible. If delay is unavoidable, hold fruit in a refrigerator at 32° to 40° F, and pack vegetables in cracked ice after cooling in ice water.

Blanch Vegetables

Blanching (scalding) vegetables halts the action of the enzymes that otherwise would cause changes in flavor and quality during storage. It also preserves or brightens the color and, in a healthy, otherwise the products, makes them easier to pack. Some fruits, too, should be blanched before freezing. (See the table.)

Blanching may be done in boiling water or flowing steam. Each piece of vegetable or fruit should be heated uniformly for long enough to halt enzyme activity, but not long enough to acquire a cooked taste. See the table for number of minutes to blanch each kind of vegetable and whether to use steam or boiling water.

To blanch in boiling water, use a gallon of water to each pound of vegetable material. Since the boiling point of water varies with elevation, the blanching time should be increased slightly at higher altitudes. At 1,000 to 3,000 feet above sea level, add one-fourth of a minute to the time given in the table; at 3,000 to 5,000 feet, one-half minute; at 5,000 to 7,000 feet, three-fourths of a minute; and at 7,000 to 9,000 feet, one minute. Blanched products should be plunged immediately into cold water. Ice water is best, but running water at 50° to 60° F is satisfactory. Don't soak too long, but use plenty of water and chill the vegetables thoroughly. Drain them immediately and pack promptly.

Sugar or Sulfur Fruits

Sugar or sugar sirup helps to maintain the color, texture, and aroma of frozen fruits. In packing with sugar, 3 to 5 parts of sugar (by weight) to 1 of sugar, mixed evenly, is recommended for most fruits. (See the table, under Packing, for specific amounts.)

Sugar sirup may be made by mixing equal quantities, by measure, of sugar and water. Other proportions are sometimes better for specific products, as recommended in the table. Dissolve the sugar by stirring rather than by heating. Put the fruit in the containers and pour just enough cold sirup over the fruit to cover it.

Dry sugar draws some moisture from fruit and tends to shrink it, but this is not important if the fruit is to be cooked. Sirup-packed fruits more nearly retain their normal size, a feature that is important in dry sugar, but they are harder to pack and freeze.

All fruits can be packed dry if sugar is unobtainable, but if this is necessary light-colored dry fruits should be blanched or frozen whole and stored in water-paper bags or in cans. If unblanched they should be defrosted in boiling water or in an iced or cold sirup. Boysenberries, youngberries, and raspberries, however, are preferably packed dry and can be defrosted at ordinary room temperature with or without the addition of sirup or sugar.

Dipping in sodium sulfite solution will prevent some kinds of color change from discoloring. Add 1 ounce of anhydrous sodium sulfite, which can be obtained at the drug store, to each gallon of water; for apples, use one-half ounce to a gallon. Use enamel-lined, glazed porcelain, glass, aluminum, stainless steel, heavily tinned, or wooden containers, never iron or copper, and do not use clips or apricot, peach, or melon halves or slices in the sulfite solution for 5 minutes. Drain, package, and freeze promptly.

Crushed and Pureed Fruit

Crushed frozen fruit makes an excellent flavor base for ice cream, sherbets, and beverages. It is good in shortcakes and cobbles and as a sundae sauce or topping. The natural flavor is very pronounced in crushed or pureed (pulped) fruits.

Fruit can be crushed with a wire potato masher or a fork. An ordinary tinny stove or a special conical fruit stove can be used for making skinless, seedless purees. Galvanized or copper screens should not be used. Stir sugar in carefully to avoid heating in much air.

When packing crushed or pureed fruit in glass, take care not to fill the jar or bottle so full as to leave no headspace. The headspace will break the narrowing shoulder or neck. Enamel or lacquered cans are resistant to the fruit acids that attack ordinary tin cans. A tight seal will prevent spoiling before freezing as well as during storage.

A few whole berries or slices of larger fruit mixed with the crushed material add attractiveness to a fruit dessert or sundae sauce.

Making Efficient Packages

A good package must first of all protect frozen food from "freezer burn," the drying effect of the extremely cold air of the freezer. It is evaporating from the surface of improperly packaged frozen foods leaving a dry, pithy water layer. Slight surface drying is not serious, but effective packaging is needed to prevent too great evaporation during a long storage period. To provide this protection the package must resist the passage of moisture and of moisture vapor.

Other desirable characteristics of a good wrapping or container are that it should be odorless and tasteless, easy to handle and seal, tough enough to resist crushing or puncturing at freezing temperatures, economical of locker space, and inexpensive. No one packaging material has all these qualities; therefore, the type best suited to the products to be stored, the available storage conditions, and the expected length of the storage period should be selected. Give the best protection to products to be stored 6 months or longer, to fruits packed in dry sugar, and to vegetables not packed in brine.

Containers and Wrappings

Glass jars with tops and rubber rings and tin cans with sealed or friction tops give efficient protection against drying and can be used more than once. They may be expensive, however, and they take up a good deal of space. Glass jars may break when moved about in the locker.

These are special vaporproof cellophanes that are almost as effective protection as glass or tin, are economical of space, and can be heat sealed easily. Cellophane can be used to line paste-board cartons to make them moisture-vapor-proof. Drawbacks are that these cellophanes are relatively expensive, are difficult to label, and may puncture or tear if roughly handled.

Waxed paperboard cups or waxed paper bags give the next best protection against drying. They are relatively cheap and are easier to fill and to label. The wax coating makes a fair seal when the lid is pressed down, or such a package may easily be opened by pulling the lid or tearing around the lid or using a special type which will adhere to wax.

Bags or containers made of laminated paper or other moisture-vapor-proof materials are also available.

Special, double-waxed paper (waxed on both sides) is widely used for wrapping frozen foods. Like the waxed cups, it will

not prevent drying as effectively as the vaporproof cellophanes, but it is cheaper, fairly tough, and reasonably efficient during storage periods of a few months. The wax may crack where the paper is creased and may chafe off if not protected.

The ordinary waxed lunch paper sold in grocery stores is only fair protection against drying. If it must be used, double wax the product and seal the seams with special cold-storage tape or heat seal with a warm iron.

Divide the prepared vegetables and fruits into proper amounts to fill the jars or cans or, if they are to be wrapped, into amounts sufficient to serve the family for one or two meals. Pack firmly into containers, leaving about half an inch of headroom for expansion. Use a funnel when filling cellophane bags that are to be heat-sealed, so that no food will touch the edges.

Heat Sealing

A hot flatiron or curling iron can be used to seal the edges and seams of cellophane and waxed-paper packages. Use just enough heat and pressure to melt the paper or wax. Press edges together and cool. Too much heat may scorch the seal and necessitate making a new one or using a new wrapping.

Emergency Coverings

Home-made bags—A satisfactory bag can be made by heat sealing the edges of folded cellophane or double-waxed paper. A strip of material 7 by 21 inches makes a 6 by 10-inch bag with half-inch folds along the sides and a 1-inch flap at the top.

A partially vapor-proof covering for cans or jars can be made by dipping clean muslin in melted paraffin. Spread the cloth flat, let the paraffin harden, and cut the material into squares large enough to fit well down over the top and sides of the can or jar. Warm the square slightly, press it down closely over the top of the filled container, and tie it tightly with string. Such waxed cloth must be handled carefully or it will crack.

Glazing—Another home-made "wrap" for frozen food is a cover of ice. To glaze vegetables or fruits, freeze them to 0° F. in a can or carton, warm it just enough to slip the food out in a block, re-freeze, then dip the block quickly in water chilled to just above the freezing point. A thin film of ice will cover the food. Repeat the process several times until the ice covering is about 1/8 inch thick. Wrap the glazing in paper to protect it from chipping and evaporation. The glaze may be renewed after a few months.

Packing in Brine

Many vegetables may be packed either dry or covered with a weak salt solution. The brine protects them against freezer burn and delays defrosting when they have to be carried home some distance from the locker. Make brine by adding 1 level teaspoon salt to each cup of water. Pack the vegetables to within 1 inch of the top of the container and cover them with the cold brine. Defrost the brine before cooking to insure even heating. Save the brine and use it, for it will contain some valuable food elements.

Label Packages Plainly

Each package or container should be marked to show the kind of product and date of storage, and, in community lockers, the owner's locker number. Special stamps, ink, and pencils are made for labeling packages of frozen food. If these are not used, strips of colored cellophane information written on in lead pencil may be pasted on the package, or tags may be pinned on.

A good plan is to use wrappings or tapes of different colors to identify different kinds of products, as red for meats, green for certain vegetables, blue for fruits, etc.

Freeze Quickly

Rapid freezing is the next step in producing high-quality frozen foods. The speed of freezing depends largely on the temperature, whether the food is in contact with the cooling coils of the freezer, the thickness of the wrappings, and the size of the package.

The freezing equipment in a locker plant usually consists of shell coils or plates and a fan to speed up the flow of -10° F. air. If packages of ordinary size are spread out on coils or plates in a rapid air stream they will freeze in 6 to 8 hours or even less.

Some locker plants have no freezer, and it is necessary to freeze the incoming food in the storage room. Rapid freezing is possible at a storage temperature of 0° F. if the packages are stirred out on shelves so that the air can move freely around them. Freezing can be done at 15° F. in circulating air and at 10° F. in still air, but these temperatures are not recommended unless the alternative is letting food spoil.

Thawing

Frozen vegetables and fruits are usually cooked without previous thawing. They can, however, be thawed in the package in warm air or water. It takes 3 to 4 hours to thaw a 1-pound package of frozen food in 75° F. air. To thaw more quickly, immerse the sealed package in 90° F. to 100° F. running water. In the home refrigerator, frozen food will take 12 to 48 hours to thaw.

Thawed frozen foods tend to spoil quickly. They should be used or cooked promptly.

Cooking Frozen Foods

Proper cooking will save much of the vitamin and mineral value that have been preserved in frozen foods by careful handling, especially if the cooking water is used.

Put frozen vegetables on to cook while they are still frozen or only partly thawed. To boil, put a small amount of water in the pan, salt it slightly, bring it to a boil, and add the vegetables. Break the melting mass apart with a fork so the hot water can reach all parts of the food as soon as possible.

Frozen vegetables cook in about half the time needed for fresh vegetables. See the table for cooking times.

Some vegetables are better boiled or steam steamed, but others may be cooked by either method. Most of the vegetables which are better boiled or steamed (see the table) have a better color when boiled but better flavor when steamed.

Serving Frozen Foods

Frozen fruits are used, for the most part, uncooked and not quite defrosted. Serve them like fresh fruit. Frozen fruit juices are best when a few ice crystals are left in them, but do not add more ice. Frozen crushed fruits are defrosted and served as sundae topping or in shortcake. Purees may be served as a frozen dessert like ice cream. Free fruit utensils and defrosted while cooking for sauce, preserves, or jam. Free fruit may be defrosted under cold syrup for direct consumption.

Preparing for Freezing • • • DIRECTIONS • • • Using Frozen Products

VEGETABLE OR FRUIT	PREPARATION	BLANCHING	PACKING	COOKING ¹ FROZEN FOOD	USES	VEGETABLE OR FRUIT	PREPARATION	BLANCHING	PACKING	COOKING ¹ FROZEN FOOD	USES
Apples	Wash, peel, trim, core, and section or slice. Slices may be held in weak brine to control discoloration during packing, or may be given a dip in sodium sulfite solution.	Blanch in boiling water for 3 to 4 minutes; cool in air or cold water. Blanching not necessary if sodium sulfite dip is used.	For a loose pack, dry-freeze on trays before packaging, otherwise freeze in package.		Pie, cobbler, open-face cake, apple butter, apple sauce.	Cabbage	Select solid, green-and-white heads, discard outside and defective leaves. Cut head into convenient-sized pieces or separate large single leaves. Wash.	Blanch cut sections 3 to 4 minutes, depending on size. Seal separate leaves for 1½ minutes. Cool in water.	Pack with or without brine.	Boil 10 to 15 minutes.	Hot vegetable.
Apricots	Sort, wash, halve, and pit. For solid, crushed, or pureed fruit, peel after scalding 15 to 30 seconds.	Blanch in boiling water for 3 to 4 minutes; cool in air or by a quick dip in cold or iced water.	Sealed apricots may be frozen loose on trays before packaging. Cover unblanched fruit with brine. Pack in 30 percent sugar syrup; or mix halves thoroughly with dry sugar, 5, 4, or 3 parts of fruit to 1 part of sugar.		Halves for pie, salad, dessert; crushed fruit for sundae topping; puree for flavor base for ice cream or sherbet and for use as a frozen dessert.	Cantaloup (Persian and similar melons)	Peel and remove seeds, dice, cut in slices or balls or coarsely crush in a food chopper.		Pack balls or slices in layers between waxed-paper sheets or use with their complete wrapping. Mix crushed melon with sugar in 4 to 1 or 3 to 1 proportions.		Balls, dice, or slices in fruit cocktails. Crushed melon in ginger ale. Serve only partly defrosted.
Asparagus	Sort into 3 or 4 diameter groups and cut into tips (4½ inches) or stalks (6 inches). 1 to 2 inches of trimmed-off stalks may be frozen to use in soup. Wash thoroughly. Do not use iron utensils.	Blanch in boiling water or steam, small diameter, 1½ minutes; medium, 2 minutes; large, 3 minutes. Cool in running water, and drain.	Pack dry, leaving contents of containers sealed during freezing, or pack in brine.	Boil 6 to 10 minutes.	Hot vegetable, in salad, or in soup.	Carrots	Cut off tops and discard inferior carrots. Scrub with a stiff brush under cold running water, trim, and dice into ½-inch cubes. Freeze whole carrots only when large pieces, not over 1 inch thick. Wash.	Blanch diced carrots in boiling water 2½ to 3½ minutes. Cool in cold water, and drain.	Pack with or without brine.	Boil or steam 5 to 10 minutes.	Hot vegetable.
Beans, lima	Sort beans, discarding imperfect ones and surgaring white overcoat. Beans for separate packing. Wash in clean cold water.	Blanch in boiling water or steam, small diameter, 1½ minutes; large beans, 2½ minutes. Cool in running water, and drain.	Pack dry or in brine.	Boil or steam, small beans, 12 to 15 minutes; large beans, 15 to 20 minutes.	Hot vegetable; in salad.	Cherries, sour	Sort, wash, and drain bright-red, fairly firm, acid-flavored cherries. A short soaking in water may make pitting easier. For a flavor base, crush coarsely.		Pack whole fruit with sugar, 5, 4, or 3 parts of fruit to 1 part of sugar. Pack crushed fruit or juice with sugar, 5 or 2 to 1.		Whole pitted for pie or cobbler; coarse crushed for ice-cream flavor base; juice for sherbet or beverage.
Beans, snap	Select sound, fresh beans, wash thoroughly, snap and string if necessary, and cut or break if desired. Avoid the use of iron utensils.	Blanch in boiling water or steam, 1½ to 2 minutes. Cool in running water, and drain.	Pack with or without brine. Better texture is usually obtained with brine. If packed dry, leave containers open during freezing, then seal.	Boil or steam green snap beans 8 to 15 minutes; steam wax beans 10 to 15 minutes.	Hot vegetable; in salad.	Cherries, sweet	Stem, sort, and wash large, firm-size cherries. Pitting not necessary but pits give an almondlike flavor. Pit and crush for sundae topping.		Pack whole cherries with sugar syrup. Pack coarsely crushed fruit or cherry juice with sugar, 3 to 1.		Whole cherries for pie, cobbler, dessert; crushed fruit for sundae toppings; juice for beverage flavor.
Beets	Cut off tops. Soak in boiling water ½ minute and cool in water quickly for easy peeling. Slice, or dice into ½-inch cubes.	Blanch slices or cubes in boiling water, 3 to 4 minutes; cool in water, and drain.	Pack without brine.	Boil for about 15 minutes. Cook in cold water; water in order to get good red color.	Hot vegetable; pickled; in salad.	Corn, sweet, whole cut	Silk and trim ears.	Scald ears in boiling water for 2 minutes and cool in cold water. Cut corn off cob with a sharp knife and slice kernels quickly in cold water, skimming any chaff off surface.	Pack without brine.	Steam 4 to 5 minutes.	Hot vegetable, corn pudding.
Blackberries	Select plump, well-opened berries. Sort, wash, and drain, handling carefully to avoid bruising berries.	Freeze whole berries on trays or in containers. Pack in sugar (4 or 5 parts fruit to 1 of sugar) for pie or in syrup for dessert use. Mix coarsely crushed or pureed berries with sugar, 3 to 1 proportion.			Pie, cobbler, jam; crushed berries for flavor base.	Corn on cob	Silk and trim. Cut ears into about 3-inch lengths and separate them into 3 diameter classes.	Blanch in steam or boiling water, small diameter, 7 minutes; medium, 9 minutes; large, 11 minutes. Cool in cold water as quickly as possible.	Wrap each ear in moisture-vapor-proof paper and twist the ends. Freeze separately on trays in containers, not over 2 dozen ears in one container.	Steam 4 to 6 minutes.	Hot vegetable.
Blueberries	Select large tender-boned berries. Sort or screen, wash, and drain.	Blueberries to be used in pies may be packed without sugar or syrup. Pack berries for dessert use in a 40- to 45-percent sugar syrup.			Pie, cobbler; crushed berries for sundae topping or sauce.	Cranberries	Sort and screen, discarding inferior berries. Wash thoroughly.		Freeze whole without sugar or syrup or pureed and packed with an equal part of sugar.		Cranberry sauce. Pureed as a frozen side dish.
Broccoli	Select dark-green, compact heads that eliminate any wormy stalks. Trim off large leaves and woody stems. Wash thoroughly. Split very large stalks lengthwise. Sort into 3 sizes of stalks.	Blanch in boiling water or steam, small diameter, 3 minutes; medium, 3½ minutes; large, 4 minutes. Cool in water, and drain.	Pack with or without brine.	Boil or steam 5 to 8 minutes.	Hot vegetable.	Figs	Figs for freezing should be ripened for fresh shipments. Wash and sort, cut off stems, leave whole or peel, halve, or slice.		Pack in 35-percent sugar syrup. Freeze thoroughly after packaging.		Dessert, preserves.
Brussels sprouts	Select firm, compact, moderately large sprouts of bright deep-green color. Discard inferior sprouts. Wash and divide into 3 sizes of sprouts.	Blanch in boiling water or steam, small diameter, 3 minutes; large, 4 minutes. Cool in water, and drain.	Pack with or without brine.	Boil 3 to 7 minutes.	Hot vegetable.	Grapes	Wash, sort, and discard inferior grapes.		Pack whole in 35- to 40-percent sugar syrup. Use enough syrup to keep grapes well covered during freezing.		Pie, dessert, juice, preserves.

¹ Cooking time in given cases. In the boiling method, when the water boils after the vegetable is put in; in the steaming method, when a heavy cloud of steam rises to the top of the skillet after the vegetable is added.

PREPARING HOME-GROWN VEGETABLES AND FRUITS FOR FREEZING

VICTORY GARDENS that bear an abundance of food for summer eating will also produce a surplus that should not be wasted. Perishable fruits and vegetables can be preserved for winter use in a number of ways. Canning, drying, salting or brining, and freezing offer a choice of methods, each of which has its advantages. The method or methods to use will depend largely on the equipment available.

Foods frozen and kept in home freezer cabinets or community freezer lockers retain their natural color, flavor, and nutritive values to a high degree. It is important, however, that they be prepared and packaged carefully and stored under the right conditions. This folder gives specific directions for preparing home-grown vegetables and fruits for freezing and also for cooking the frozen products.

How Freezing Preserves Foods

All fresh foods contain bacteria, molds, and yeasts that multiply and cause spoilage if they are allowed to grow. Lower temperatures slow down their growth. Blanching (scalding) vegetables before freezing them destroys some bacteria, and many more are killed by subzero temperatures. A few always remain in the food, however, to start spoilage when it is thawed. Frozen foods, therefore, should be treated as fresh foods and used or cooked promptly.

Chemical agents called enzymes are also present in all living matter. In plant products they first bring about ripening and then spoilage. Their action is slowed down at lower temperatures, much as is that of bacteria, but no economical freezing temperature will stop it completely. A temperature of 0° F. is required to stop enzyme activity sufficiently for safe storage for any length of time.

By slowing down the action of all these spoilage agents, freezing keeps fresh food for 6 months to a year or more in approximately the same condition as when stored.

Handle and Prepare Foods Carefully

Clean foods prepared with clean equipment and pure water contain fewer spoilage organisms. Sort, wash, and prepare fruits and vegetables for freezing in the same way as for the table. Avoid unnecessary handling, particularly of ripe fruit.

Do not waste locker space by filling it with produce that will not be suitable in every way for immediate use when removed from the locker. Freeze all fruits and vegetables the day they are picked—within a few hours if possible. If delay is unavoidable, hold fruit in a refrigerator at 32° to 40° F. and pack vegetables in cracked ice after cooling in ice water.

Blanch Vegetables

Blanching (scalding) vegetables halts the action of the enzymes that otherwise would cause changes in flavor and quality during storage. It also preserves or brightens the color and, by slightly softening the products, makes them easier to pack. Some fruits, too, should be blanched before freezing. (See the table.)

Blanching may be done in boiling water or flowing steam. Each piece of vegetable or fruit should be heated uniformly for long enough to halt enzyme activity, but not long enough to acquire a cooked taste. See the table for number of minutes to blanch each kind of vegetable and whether to use steam or boiling water.

To blanch in boiling water, use a gallon of water to each pound of vegetable material. Since the boiling point of water varies with elevation, the blanching time should be increased slightly at higher altitudes. At 1,000 to 3,000 feet above sea level, add one-fourth of a minute to the time given in the table; at 3,000 to 5,000 feet, one-half minute; at 5,000 to 7,000 feet, three-fourths of a minute; and at 7,000 to 9,000 feet, 1 minute.

The blanched products should be plunged immediately into cold water. Iced water is best, but running water at 50° to 60° F. is satisfactory. Don't soak too long, but use plenty of water and chill the vegetables thoroughly. Drain them immediately and pack promptly.

Sugar or Sulfur Fruits

Sugar or sugar sirup helps to maintain the color, texture, and aroma of frozen fruits. In packing with sugar, 3 to 5 parts of fruit (by weight) to 1 of sugar, mixed evenly, is recommended for most fruits. (See the table, under Packing, for specific amounts.)

Sugar sirup may be made by mixing equal quantities, by measure, of sugar and water. Other proportions are sometimes better for specific products, as recommended in the table. Dissolve the sugar by stirring rather than by heating. Put the fruit in the containers and pour just enough cold sirup over the fruit to cover it.

Dry sugar draws some moisture from fruit and tends to shrink it, but this is not important if the fruit is to be cooked. Sirup-packed fruits more nearly retain their normal size and shape than those packed in dry sugar, but they are harder to pack and freeze.

All fruits can be packed dry if sugar is unobtainable, but if this is necessary light-colored tree fruits should be blanched or frozen whole and stored in waxed-paper bags or in cans. If unblanched they should be defrosted in boiling water or in boiling or cold sirup. Boysenberries, youngberries, and raspberries, however, are preferably packed dry and can be defrosted at ordinary room temperature with or without the addition of sirup or sugar.

Dipping in sodium sulfite solution will prevent some kinds of cut fruits from discoloring. Add 1 ounce of anhydrous sodium sulfite, which can be obtained at the drug store, to each gallon of water; for apples, use one-half ounce to a gallon. Use enameled, glazed porcelain, glass, aluminum, stainless steel, heavily tinned, or wooden containers, never iron or copper, and do not allow the solution to stand in the utensil after use. Dip apple slices or apricot, peach, or nectarine halves or slices in the sulfite solution for 5 minutes. Drain, package, and freeze promptly.

Crushed and Pureed Fruit

Crushed frozen fruit makes an excellent flavor base for ice cream, sherbets, and beverages. It is good in shortcakes and cobbblers and as a sundae sauce or topping. The natural flavor is very pronounced in crushed or pureed (pulped) fruit.

Fruit can be crushed with a wire potato masher or a fork. An ordinary tinned sieve or a special conical fruit sieve can be used for making skinless, seedless purees. Galvanized or copper screen should not be used. Stir sugar in carefully to avoid beating in much air.

When packing crushed or pureed fruit in glass, take care not to fill the jar or bottle so full that the freezing liquid in expanding will break the narrowing shoulder or neck. Enamel or lacquer-lined cans are resistant to the fruit acids that attack ordinary tin cans. A tight seal will prevent spilling before freezing as well as drying during storage.

A few whole berries or slices of larger fruit mixed with the crushed material add attractiveness to a fruit dessert or sundae sauce.